CLAIMS

1. An *in vitro* method that comprises:

c) the detection and/or quantification of the Plexin-B1 protein, of the mRNA of the *plexin-B1* gene, or of the corresponding cDNA in a sample of an individual, and

d) the comparison of the amount of Plexin-B1 protein, of the amount of *plexin-B1* gene mRNA or of the amount of the corresponding cDNA detected in a sample from an individual, with their normal reference values.

2. An *in vitro* method according to claim 1 which is employed to detect the presence of renal cancer in an individual, to determine the stage or severity of this cancer in an individual or to monitor the effect of the therapy administered to the individual with this cancer.

3. Method according to claims 1 and 2, wherein said sample is a kidney tissue sample.

4. Method according to claim 3, wherein said kidney tissue sample to be analyzed is obtained by any conventional method, preferably nephrectomy.

5. Method according to claims 1 and 2, wherein said sample is a urine, blood, plasma, serum, pleural fluid, ascitic fluid, synovial fluid, bile, semen, gastric juice or cerebrospinal fluid sample.

6. Method according to claims 1 and 2, wherein said sample to be analyzed is obtained from an individual who has not previously been diagnosed with renal cancer.

7. Method according to claims 1 and 2, wherein said sample to be analyzed is obtained from an individual who has previously been diagnosed with renal cancer.

8. Method according to claims 1 and 2, wherein said sample to be analyzed is obtained from an individual undergoing treatment, or who has been treated previously, for renal cancer.

9. Method according to claims 1 and 2, characterized in that it comprises the extraction of the sample, either for obtaining a protein extract or for obtaining an extract of total RNA.

10. Method according to claims 1 and 2, characterized in that the detection and/or quantification of the Plexin-B1 protein comprises a first step, in which the protein extract of the sample is placed in contact with a composition of one or more specific antibodies against one or more epitopes of the Plexin-B1 protein, and a second step, in which the complexes formed by the antibodies and the Plexin-B1 protein are quantified.

11. Method according to claim 10, characterized in that said antibodies comprise monoclonal antibodies, polyclonal antibodies, either intact or recombinant fragments thereof, combined antibodies and Fab or scFv antibody fragments, specific against the Plexin-B1 protein; these antibodies being human, humanized or of a non-human origin.

12. Method according to claims 10 or 11, characterized in that in the detection and/or quantifiction of the complexes formed by the antibodies and the Plexin-B1 protein, the techniques used are selected from the group formed by: Western-blot, ELISA (Enzyme-Linked Immunosorbent Assay), RIA (Radioimmunoassay), Competitive EIA (Competitive Enzyme Immunoassay), DAS-ELISA (Double antibody Sandwich-ELISA), immunocytochemical and immunohistochemical techniques, techniques based on the use of biochips or protein microarrays that include specific antibodies, assays based on precipitation with colloidal gold in formats such as dipsticks; or by means of affinity chromatography techniques, ligand binding assays or lectin binding assays.

13. Method according to claims 1 and 2, characterized in that the detection and/or quantification either of the mRNA or of the corresponding cDNA of the *plexin-B1* gene comprises a first step of amplification of the mRNA that is present in the extract of total

RNA, or of the corresponding cDNA synthesized by reverse transcription of the mRNA; and a second step of quantification of the amplification product from either the mRNA or the cDNA of the *plexin-B1* gene.

14. Method according to claim 13, characterized in that the amplification is performed qualitatively or quantitatively by means of RT-PCR using primer oligonucleotides, where the sequences of the primers used to amplify the sequence of the *plexin-B1* gene are SEQ ID NO.1 and SEQ ID NO.2.

15. Method according to claims 1 and 2, characterized in that the detection and/or quantification is done with specific probes of the mRNA or of the corresponding cDNA of the *plexin- B1* gene by techniques such as the Northern-blot or Northern transfer.

16. Method according to claims 1 and 2, characterized in that the detection of the mRNA is done by real time quantitative RT- PCR (Q-PCR).

17. Use of nucleotide or peptide derivatives of the *plexin-B1* gene to detect *in vitro* the presence of renal cancer in an individual, for determining *in vitro* the stage or severity of said cancer in the individual or for monitoring *in vitro* the effect of the therapy administered to an individual having said cancer.

18. An *in vitro* method for identifying and assessing the efficacy of compounds for renal cancer therapy, comprising:

a) placing an immortalized kidney cell culture, in contact with the candidate agent under the conditions and for the time which are suitable for allowing them to interact,

b) detecting and quantifying the *plexin-B1* gene or Plexin-B1 protein expression levels, and

c) comparing said expression levels with those of immortalized kidney cell control cultures not treated with the candidate compound.

19. Use of nucleotide or peptide sequences derived from the *plexin-B1* gene in methods for the search, identification, development and assessment of the efficacy of compounds for renal cancer therapy

20. An agent that induces Plexin-B1 protein expression and/or activity, or that inhibits the carcinogenic effects of the repression of Plexin-B1 protein expression.

21. An agent according to claim 20, selected from the group formed by:

a) recombinant vectors expressing the Plexin-B1 protein,

b) cytotoxic agents such as toxins, molecules with radioactive atoms, or chemotherapeutic agents, included among which are, with no limit, small organic and inorganic molecules, peptides, phosphopeptides, anti-sense molecules, ribozymes, triple-helix molecules, double-strand RNA, etc., inhibiting the carcinogenic effects of the repression of Plexin-B1 protein expression and/or activity, and

c) Plexin-B1 protein agonist compounds, which induce, mimic or replace one or more of the functions of the Plexin-B1 protein.

22. Agent according to claims 20 or 21 for treating renal cancer.

23. Plexin-B1 protein for use as a medicament, in particular as a medicament for treating renal cancer.

24. Use of any of the agents according to claims 20 or 21 in the preparation of a drug for treating renal cancer.

25. Use of the Plexin-B1 protein in the preparation of a drug for treating renal cancer.

26. Pharmaceutical composition comprising a therapeutically effective amount of at least one agent according to claims 20 or 21, and at least one pharmaceutically acceptable excipient.

27. Pharmaceutical composition comprising a therapeutically effective amount of Plexin-B1 protein, and at least one pharmaceutically acceptable excipient.

28. A pharmaceutical composition according to claims 26 and 27, characterized in that it contains another drug substance, preferably one inducing the Plexin-B1 protein function.

29. A kit that comprises an antibody that specifically recognizes the Plexin-B1 protein and a carrier in suitable packaging

30. A kit that comprises a primer pair designed to specifically amplify a nucleic acid having a sequence that is specific to the *plexin-B1* gene.

31. A kit according to claim 30 wherein the sequence of the primer pair is selected from SEQ ID NO.1 and SEQ ID NO. 2.

32. A kit according to claims 29 to 31 that is employed to detect the presence of kidney cancer in an individual, to determine the stage or severity of this cancer in an individual or to monitor the effect of the therapy administered to the individual with this cancer.